

REMARKS:

Claims 1-15, 17, and 18 were pending in this application. With this amendment, the applicants are amending claims 1, 2, 4, 10, 12, and 18. Claim 11 has been canceled. Upon entry of this amendment, claims 1-10, 12-15, 17, and 18 are the pending claims in this application.

In the Office Action dated June 18, 2003, claims 1-4, 10, 12, and 18 were objected to for reciting improper Markush group language. Claims 4 and 11 were rejected under 35 U.S.C. § 112, second paragraph as being indefinite. Claim 11 was rejected under 35 U.S.C. § 101. Claims 1-7, 9-12, 14, 17, and 18 were rejected under 35 U.S.C. 102 (b) as being anticipated by Gunner et al., (EP 838 872 A2).

The applicants acknowledge with appreciation the Examiner's indication that claims 8, 13, 15 were be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The applicants believe, for the reasons discussed below, that claim 1 is allowable and, therefore, dependent claims 8, 13, and 15 are allowable without being rewritten in independent form.

Claim Objections

Claims 1-4, 10, 12, and 18 stand objected for reciting improper Markush group language. In response to this objection, the claims have been amended in the manner suggested by the Examiner so that each claim recites proper Markush group language. The applicants respectfully request withdrawal of the objection.

Rejection Under 35 U.S.C. § 112, Second Paragraph

Claims 4 and 11 stand rejected under 35 U.S.C. § 112, second paragraph, as indefinite for failure to particularly point out and distinctly claim the subject matter which the applicants regards as the invention. Specifically, the

Examiner contends that claim 4 recites "Wherein the first catalytic component is selected from: Pt/Mo, Pt/MO/Co, Pt/W/Co, Pt/Ru/WO₃ and Pt/Ti/W. However, Co, Ru and Ti are not possible metals for 'Y' in claim 1 (from which Claim 4 depends)." See page 2 of the Office Action. With respect to claim 11, the Examiner states that the claim "provides for the use of an electrode structure, but, since the claim does not set forth any steps involved in the method process, it is unclear what method/process" the applicants are intending to encompass." *Id.* at 2-3. Claim 11 has been canceled rendering the rejection moot with respect to this claim. For the reasons set forth below, the applicants respectfully submit that claim 4 is not indefinite.

At the outset, the applicants note that the Examiner has correctly stated that Co, Ru, and Ti are not possible metals for "Y" as claimed in claim 1. See page 2 of the Office Action. The applicants respectfully disagree because each of the first catalytic components listed in claim 4 (Pt/Mo, Pt/Mo/Co, Pt/W/Co, Pt/Ru/WO₃ and Pt/Ti/W) does contain a feature which is identifiable as Y. Specifically, Pt/Mo (Y is Mo), Pt/Mo/Co (Y is Mo), Pt/W/Co (Y is W), Pt/Ru/WO₃ (Y is WO₃) and Pt/Ti/W (Y is W). Claim 1 allows for the first catalyst component to contain metals in addition to Pt and Y. The claimed invention is directed to an electrode structure *comprising* a first catalytic component and a second catalytic component. The applicants note that Co, Ru, and Ti are such additional metals.

For the reasons set forth above, the applicants submit that claim 4 does in fact distinctly claim the subject matter which the applicant regards as the invention. Accordingly, the applicants respectfully request withdrawal of this rejection.

Rejection Under 35 U.S.C. § 101

Claim 11 stands rejected under 35 U.S.C. 101. Specifically, the Examiner states that the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process. Claim 11 has been canceled rendering the rejection moot.

Rejection Under 35 U.S.C. § 102 (b)

Claims 1-7, 9-12, 14, 17, and 18 stand rejected under 35 U.S.C. § 102 (b). Specifically, the Examiner contends that Gunner '872 anticipates the invention. The Examiner states that Gunner '872 discloses an electrode comprising a catalyst comprising a Pt-M alloy. The examiner contends that the second catalytic component of at least claim 1 is disclosed by Gunner as a Pt-M alloy wherein M is selected from Ru, Rh, Ti, Cr, Mn, Fe, Co, Ni, Cu, Ga, Zr, Hf, and Sn, preferably Ru, Mn, Co, Ni, Rh and that the catalyst further comprises component Y wherein Y is preferably Mo, or W, or an oxide thereof. See page 3 of the Office Action. The Examiner also states that Gunner teaches that the Pt-M component and the Y component may be unalloyed, but in physical contact. See page 4 of the Office Action. The Examiner also states that "when the Y component contacts the Pt-M component, the Y component contacts Pt and thus Gunner teaches the first catalytic component Pt-Y." Claim 11 had been canceled rendering the rejection moot with respect to this claim. For the reasons set forth below, the applicants respectfully submit that claims 1-7, 9, 10, 12, 14, 16, and 18 are not anticipated by Gunner '872.

The applicants respectfully disagree that Gunner '872 discloses all of the features of the present invention as claimed in independent claims 1 and 10. Specifically, the claimed invention contains two separate catalytic components, namely, **a first catalytic component and a second catalytic component**. Also, the applicants note that the term "electrode structure" as used in the claims does not refer to a specific physical embodiment. The term "electrode structure" as defined in the specification, refers to compositional aspects of those parts of the electrochemical cell where the electrochemical reactions take place. Thus, the claimed invention calls for an electrode structure having a first and second catalytic composition at which electrochemical reactions take place. See specification at page 10, lines 18-20. Further, the present invention as claimed in claims 1 and 10 requires that "the first and second catalytic components are in ionic contact with each other." Gunner '872 fails to teach a first and second catalytic component, let alone, catalytic components in ionic contact with each other.

The applicants offer the following in order to explain the basis for distinction between the claimed invention and the cited reference. A single catalytic component may contain two electrocatalyst metals (or metal oxides), three electrocatalyst metals or metal oxides, or possibly even more electrocatalyst metals which may be either alloyed, or unalloyed but in physical contact. Thus, in a single catalytic component, such as that described in Gunner '872, all the metals and metal oxides are in intimate contact with each other either by alloying or physical mixing and are therefore, able to function as a single catalytic component. By contrast, separate catalytic components, as called for by the claimed invention, are not in intimate contact with each other. If the metals and metal oxides in separate catalytic components were to be in intimate contact with each other, they would fail to function as separate catalytic components.

The claimed invention requires two separate catalytic components that are in ionic contact and not in intimate contact with either other. Clearly, the claimed invention is distinguishable from Gunner '872 which discloses a single catalytic component comprising Pt-M-Y, wherein PT-M is an alloy of one or more of the metals selected from the transition metal elements or from Groups IIIA or IVA of the Periodic Table in "Handbook of Chemistry and Physics" 64th Ed., CRC Press, and "Y is a bronze forming element or an oxide thereof, characterized in that the Pt-M alloy is in intimate contact with Y and provided that M is not Ru if Y is WO₃. See Gunner '872 abstract. See also page 3, lines 30-35, 51-52. As described in the application, although CO tolerance is observed in electrocatalysts aimed at improving CO tolerance, such as in Gunner '872, the presence of CO₂ in the reformat fuel causes larger performance losses than that observed when alloys of platinum and ruthenium are used. The applicants note that the claimed invention results in a significant improvement in CO and CO₂ tolerance by providing a Pt/Ru-type electrocatalyst in ionic contact with a further electrocatalyst. See page 7, line 8 through page 8, line 3 of the specification. Thus, the claimed invention is directed to two separate catalytic components in ionic contact with each other and not a single catalytic component. Additionally, the claimed invention is not directed to separate catalytic components in intimate or physical contact with each other. If the two catalytic components of the claimed invention were to be in intimate contact, as opposed to ionic contact, they would not function as separate catalytic components.

Further, if they were in "intimate contact" they could not be properly characterized as "first and second catalytic components" of an "electrode structure" as claimed. Even when the first and second catalytic components of the present invention are formulated into one mixed layer, they are merely in ionic contact and not intimate contact.

The applicants respectfully submit that the Examiner is mistaken with respect to the assertion that Gunner '872 discloses teaches a first and second catalytic component that are separate. The applicants submit that Gunner '872 neither discloses or suggests two separate catalytic components. The invention disclosed in Gunner '872 is directed to a single catalytic component wherein Pt and M are alloyed and Y is in intimate contact with the Pt-M alloy. See for example page 3, lines 30-36. There is no contemplation, whatsoever in Gunner '872 of two separate catalytic components. That Gunner '872 is directed to a single catalytic component is supported by the fact that the specification states that Y is in intimate contact with the Pt-M alloy. See for example page 3, lines 34 and 51-52. Because Pt-Y and Pt-M are in intimate contact, they comprise a single catalytic component and, therefore, cannot be two distinct catalytic components nor function as two distinct catalytic components as in the present invention. Moreover, Gunner '872 defines the term "intimate contact" and states: "by the term 'intimate contact' we mean that component Y may either be alloyed with the Pt-M alloy...or may be unalloyed but is in physical contact with the alloy. See page 3, lines 51-52. Accordingly, the applicants submit that Gunner '872 discloses a single catalytic component and that it is improper to describe Pt-M and Pt-Y as distinct catalytic components because they are in intimate contact.

For the reasons set forth above, the applicants submit that independent claims 1 and 10 and dependent claims 2-7, 9, 12, 14, 16, and 18 are not anticipated by Gunner '872. Accordingly, the applicants respectfully request withdrawal of this rejection.

CONCLUSION

For the aforementioned reasons, the applicants submit that the pending claims are in condition for allowance. All grounds for objection or rejection have been overcome by the present amendment. Additionally, the newly added claim has full support in the specification and no new matter has been added. For all of these reasons, the applicants respectfully submit that the rejections under 35 U.S.C. §§ 101 and 102 should be withdrawn and favorable action is earnestly solicited.

Respectfully submitted,



Christopher R. Lewis, Reg. No. 36,201
Attorney for Applicants

PAM/kak

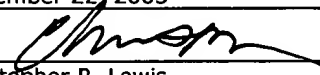
Dated: September 22, 2003

P.O. Box 980
Valley Forge, PA 19482-0980
(610) 407-0700

The Assistant Commissioner for Patents is hereby authorized to charge payment to Deposit Account No. **18-0350** of any fees associated with this communication.

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail, with sufficient postage, in an envelope addressed to: Mail Stop Non-Fee Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on:

September 22, 2003



Christopher R. Lewis

LRB_I:\JMYT\239US\AMEND01.DOC